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(71)(72) Applicant and Inventor: MOORE, Nicholas, Lucius, John [GB/GB]; 8 Orme Court, London W2 4RL (GB).

(74) Agent: BURFORD, Anthony, Frederick; W.H. Beck, Greener & Co, 7 Stone Buildings, Lincoln's Inn, London WC2A 3SZ (GB).

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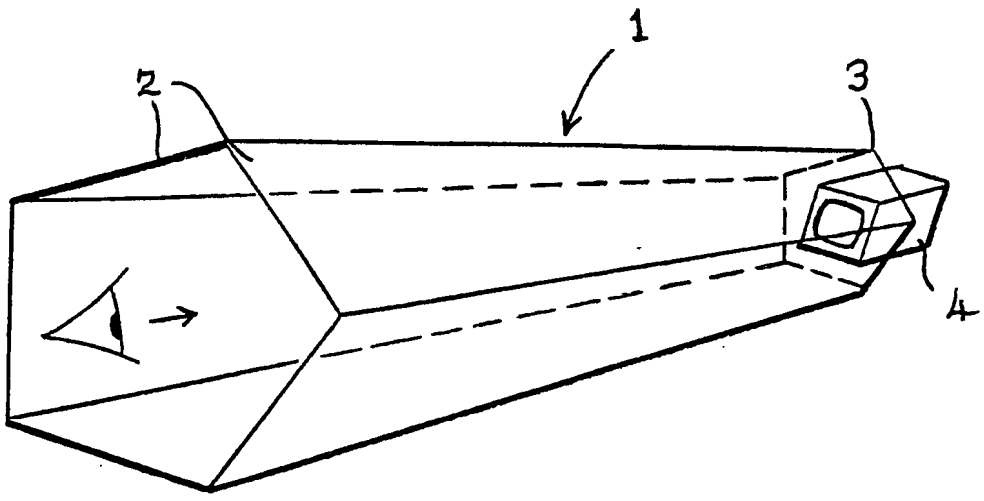

(57) Abstract

A kaleidoscopic viewing device (1) has a longitudinally polygonal structure (2) with a viewing end, and a remote end (3) of less cross-sectional dimensions, the structure being longitudinally light-transmissive and being internally-reflective, and an image producer (4) for producing intermediately along the structure or at or somewhat beyond its remote end, a light-emitting and variable image, such that a viewer looking internally along the structure in the direction from the viewing end towards the remote end is presented with a multi-faceted composite field of view in which each facet includes the variable image.

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KALEIDOSCOPIC VIEWING DEVICE

This invention relates to the production of kaleidoscopic images.

The object of the invention is to provide a device operative on the kaleidoscopic principle and adapted to provide a composite image in the form of a portion of an apparent sphere composed of a large number of facets, each of which facets displays the same item of subject matter.

According to the present invention, a kaleidoscopic viewing device comprises a structure which is polygonal about a longitudinal axis and which has a viewing end and a remote end, the remote end being of less cross-sectional dimensions than the viewing end, the structure being light-transmissive in the axial direction and being internally-reflective at its lateral boundaries, and means for producing, intermediately along the structure or at or somewhat beyond its remote end, a light-emitting and variable image, such that a viewer looking internally along the structure in the direction from the viewing end towards the remote end is presented with a multi-faceted composite field of view in which each facet includes the variable image.

The polygonal structure may have any desired number of sides, and may be equilateral or have one or more sides unequal to one or more other sides.

The structure may be solid, provided that it is adequately light-transmissive, but preferably is hollow and has internally reflective walls.

The internally-reflective property may be obtained by having walls of the polygon reflective on their inner face, or, where the walls are transparent or translucent, by having the walls reflective on their outer face.

The lateral boundaries, e.g. the walls of the polygon, may be reflective over all or only part of their area, and they may be made of a totally reflective nature, or may be partially reflective and partially light-transmissive, e.g. half-mirrored.

The polygonal structure may terminate in a point at the remote end, or it may be truncated, at the remote end, and in the latter case it may be closed by an end wall at the truncated remote end, e.g. by a plane or non-plane surface normal or at another angle to the longitudinal axis of the structure.

The variable light image may be produced substantially axially of the structure, and/or laterally of the axis of the structure. Light or other excitation may be introduced at any point, or a number of points, longitudinally and/or laterally of the axis of the structure.

The variable image may be produced by direct

projection of light rays, as by a light projector, or by impingement of rays, such as light rays, or other excitation, on a target or receiver, or by energisation of a target or receiver by any form of rays or other excitation directed to it or on it or produced within it. In preferred embodiments, the variable image is produced by a display tube similar to that of a television receiver or computer terminal, or a holographic apparatus, or by an optical fibre source or a translucent screen on which light is projected.

Advantageously, the intensity of the image produced is sufficient to enable the image to be projected from the viewing end of the device.

The image is a produced image, as distinct from viewing of a static object, and may thus change in form, colour, intensity, size and content continuously or at intervals, or intermittently by relation to music, as with known strobe lights.

In order that the nature of the invention may be readily ascertained, two embodiments of kaleidoscopic viewing device in accordance therewith are hereinafter particularly described with reference to the figures of the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of a first embodiment of device, having insertion of light along a longitudinal axis of the device; and

Figure 2 is a schematic perspective view of a second embodiment of device, having insertion of light laterally with respect to the longitudinal axis of the device.

Referring to Figure 1, a kaleidoscopic device comprises a polygonal structure generally indicated by reference numeral 1 which has a number of walls 2 and which is tapered in the direction along its central longitudinal axis and is truncated at its remote end 3. The device is to be viewed in the axial direction indicated by the arrow. The walls 2 are internally reflective, so that a viewer looking in the direction of the arrow will see, by kaleidoscopic effect, a multiple reproduction of any image subject matter which is presented internally of the structure.

At or adjacent the truncated end 3 there is positioned a source 4 of image subject matter, adapted to be viewed along the structure, and/or to project image subject matter along the structure. The source 4 might be, for example, an apparatus having a television viewing screen, or a ground glass screen, or equivalent, may receive subject matter by front or back projection, from a film projector, a photographic projector, an epidiascope, or other multiple light source.

To the viewer, looking in the direction of the arrow, there will be visible a major portion of an

apparent sphere composed of a large number of facets each of which contains the image subject matter being presented by the source 4.

In a modification of this embodiment, the source 4 could represent means for projecting a holographic image into the structure at or near to the end 3.

Referring now to Figure 2, the structure 1 is generally the same as described above in relation to Figure 1 but the end 3 is either left open, or is closed by a wall 3a which may itself be internally reflecting.

In a wall 2, or in more or all of the walls 2, there is provided a means 5 for the introduction of image subject matter laterally of the central longitudinal axis of the structure. In the example shown, the imaging means consists of a panel 6, for example secured in or on or forming part of a or the walls 2, to which are attached a number of optical fibres 7 whose output ends are visible within the structure, the optical fibres being fed with subject matter from a conventional light source 8. As an alternative to direct viewing of the output ends of the fibres 7 within the structure, the fibres 7 may be arranged to cast a light image onto a receiver member 9, here shown in broken line as a sphere, but the member 9 could be of any shape, and reflective or not. The panel 6, and the member 9 when used, are shown as

being located at an intermediate point along the axis of the device, but could equally well be located at or near or external to the smaller end of the structure. It will be appreciated that the panel 6 alone or with member 9 could be used as the image source in the embodiment described with reference to Figure 1.

Similarly with the embodiment of Figure 2, the viewer looking in the direction of the arrow will see an apparent portion of a sphere composed of a large number of facets each of which contains the subject matter introduced laterally in the wall or walls 2 having a panel 6.

The structure 1 may be made of such large size that a viewer may enter the viewing end thereof, and may progress towards the remote end and be at the same time presented with the multi-faceted composite field of view.

CLAIMS

1. A kaleidoscopic viewing device comprising a structure which is polygonal about a longitudinal axis and which has a viewing end and a remote end, the remote end being of less cross-sectional dimensions than the viewing end, the structure being light-transmissive in the axial direction and being internally-reflective at its lateral boundaries, and means for producing, intermediately along the structure or at or somewhat beyond its remote end, a light-emitting and variable image, such that a viewer looking internally along the structure in the direction from the viewing end towards the remote end is presented with a multi-faceted composite field of view in which each facet includes the variable image.

2. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the structure is hollow and has internally-reflective walls.

3. A kaleidoscopic viewing device, as claimed in Claim 2, wherein the walls are reflective on their inner face.

4. A kaleidoscopic viewing device, as claimed in

Claim 2, wherein the walls are transparent or translucent and are reflective on their outer face.

5. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the lateral boundaries are partially reflective and partially light-transmissive.

6. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the polygonal structure terminates in a point at the remote end.

7. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the polygonal structure is truncated at the remote end.

8. A kaleidoscopic viewing device, as claimed in Claim 7, wherein the polygonal structure is closed by an end wall at the truncated remote end.

9. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the image is produced substantially axially of the structure.

10. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the image is produced laterally of the axis of the structure.

11. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the image-producing means is a light projector.

12. A kaleidoscopic viewing device, as claimed in Claim 1, wherein the image-producing means operates by impingement of rays or excitation on a target or receiver.

13. A kaleidoscopic viewing device, as claimed in Claim 12, wherein the image-producing means comprises a translucent screen on which light is projected.

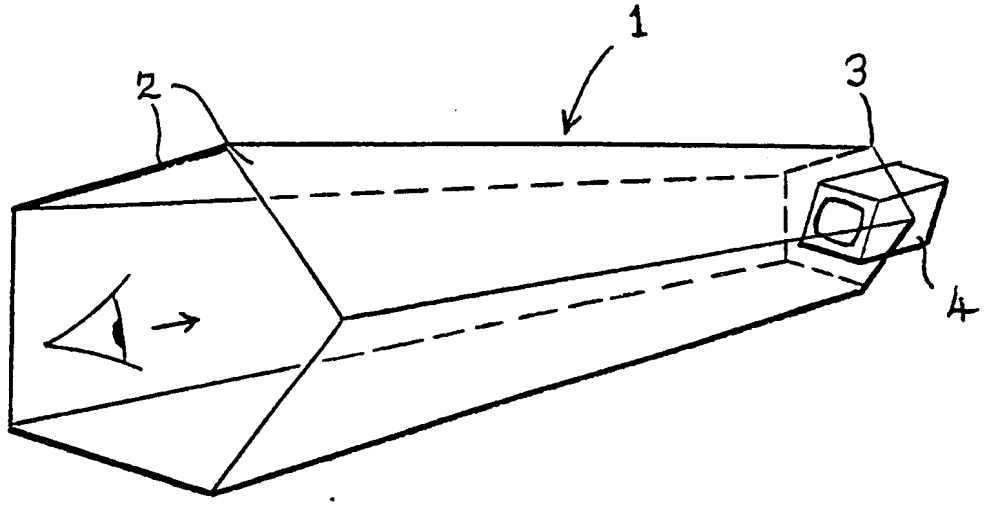

Fig. 1

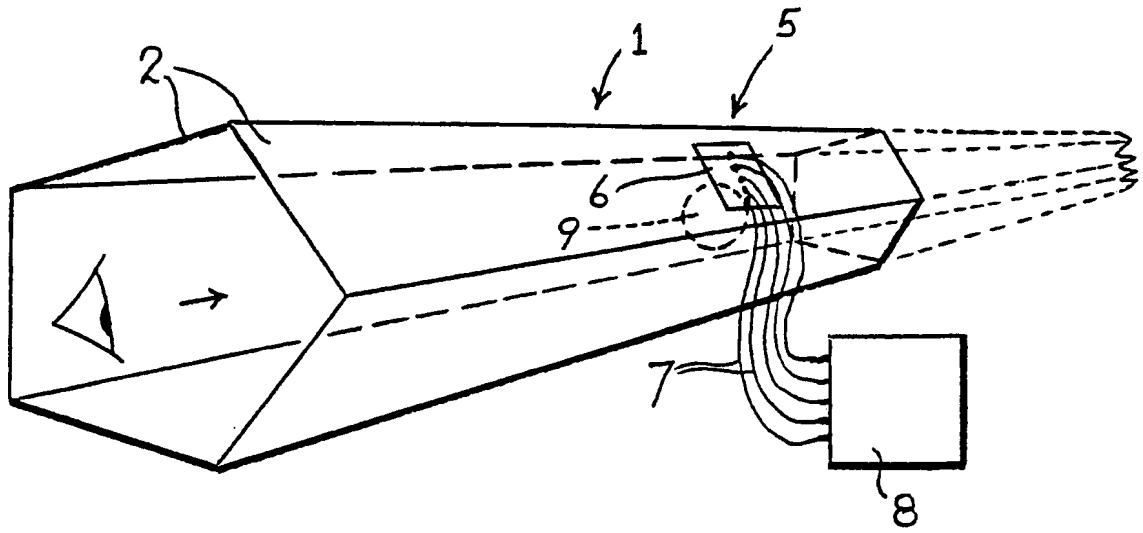

Fig. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 88/00426

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4]: G 02 B 27/08

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC[4]	G 02 B

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X	FR, A, 2585853 (C. AMORETTI) 6 February 1987 see page 5, line 20 - page 6, line 31; figures 1,2; claims 1,3,4,7 --	1-3,5-9, 13
A	GB, A, 1558970 (N.L.J. MOORE) 9 January 1980 see claims	1

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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
3rd August 1988	02 SEP 1988
International Searching Authority	Signature of Authorized Officer
EUROPEAN PATENT OFFICE	P.C.G. VAN DER PUTTEN

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 8800426 SA 22405

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 30/08/88
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 2585853	06-02-87	None	
GB-A- 1558970	09-01-80	None	